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UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Adel Farhan Halasa et al

For: FUNCTIONALIZED MONOMERS

FOR SYNTHESIS OF RUBBERY

POLYMERS

Serial No.: 10/661,914

Filed: September 12, 2003

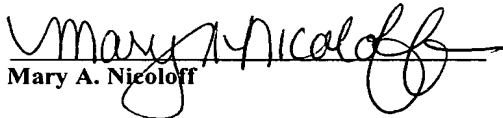
) Docket No. DN2002-237P02

) Art Unit: 1713

) Examiner: Fred Teskin

)

) I hereby certify that this correspondence is being  
) deposited with the United States Postal Service as  
) first class mail in an envelope addressed to:  
) Commissioner for Patents, P.O. Box 1450,  
) Alexandria, VA 22313-1450, on June 14, 2004.

)   
Mary A. Nicoloff

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**INFORMATION DISCLOSURE IN COMPLIANCE WITH 37 C.F.R. §1.98**

As a means of complying with the duty of disclosure set forth in 37 C.F.R. §1.56, the Applicants are calling the following to the attention of the Patent Office and request that they be considered by the Examiner:

United States Patent 6,111,045

United States Patent 6,211,321

United States Patent 4,935,471

United States Patent 6,080,835

United States Patent 5,932,662

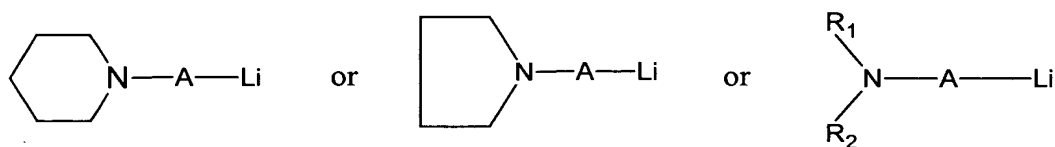
United States Patent 6,084,025

United States Patent 6,344,538

United States Patent 6,111,045 and United States Patent 6,211,321 may be relevant to the prosecution of the subject patent application because they were cited by the Examiner in the prosecution of United States Patent Application Serial Number 10/247,243 of which the subject patent application is a divisional. United States Patent 6,111,045 discloses a diene rubber composed of 40 to 99.99% by weight of conjugated diene units, 0.05 to 20% by

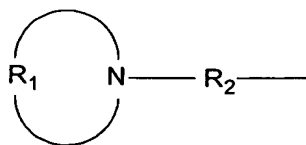
weight of amino-containing vinyl monomer units, 0.05 to 20% weight of hydroxyl-containing vinyl monomer units, and 0 to 50% by weight of other copolymerizable monomer units, and having a Mooney viscosity ( $ML_{1+4}$  at  $100^{\circ}C$ ) of 10 to 200. United States Patent 6,211,321 more specifically discloses a diene rubber which is composed of 40 to 99.99% by weight of conjugated diene monomer units, 0 to 50% by weight of aromatic vinyl monomer units, and 0.01 to 20% by weight of vinyl monomer units containing a tertiary amino group which is at least partially quaternized with a hydrocarbon radical, and has a Mooney viscosity ( $ML_{1+4}$  at  $100^{\circ}C$ ) of 10 to 200.

United States Patent 4,935,471 may be relevant to the prosecution of the subject patent application because it discloses that lithium amides are highly preferred initiators because they can be used to prepare polydienes which are terminated with polar groups at both ends of their polymer chains. The extra polar functionality provided by lithium amides results in increased interaction with carbon black resulting in better polymer-carbon black dispersion. The lithium amides disclosed by United States Patent 4,935,471 include lithium pyrrolidide. United States Patent 4,935,471 also indicates that preferred initiators include amino alkyl lithium compounds of the structural formula:



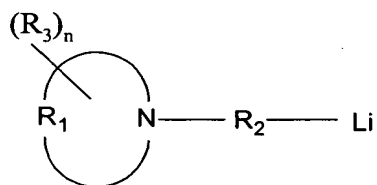
wherein A represents an alkylene group containing from 1 to 20 carbon atoms, and wherein  $R_1$  and  $R_2$  can be the same or different and represent alkyl groups containing from 1 to 20 carbon atoms.

United States Patent 6,080,835 may be relevant to the prosecution of the subject patent application because it discloses a functionalized elastomer comprising: a functional group defined by the formula:



where  $R_1$  is a selected from the group consisting of a divalent alkylene group, an oxy-alkylene group, an amino alkylene group, and a substituted alkylene group, each group having from about 6 to about 20 carbon atoms,  $R_2$  is covalently bonded to the elastomer and is selected from the group consisting of a linear-alkylene group, a branched-alkylene group, and a cyclo-alkylene group, each group having from about 2 to about 20 carbon atoms.

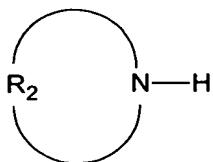
United States Patent 5,932,662 may be relevant to the prosecution of the subject patent application because it discloses a method of preparing a polymer comprising: preparing a solution of one or more anionically polymerizable monomers in a solvent; and, polymerizing under effective conditions, said monomers in the presence of a polymerization initiator having the formula



wherein  $R_1$  is a divalent alkylene, an oxy- or amino-alkylene having from 6 to about 20 carbon atoms; and,  $R_2$  is a linear-alkylene, branched-alkylene, or cyclo-alkylene having from about 2 to about 20 carbon atoms, Li is a lithium atom bonded directly to a carbon atom of  $R_2$ ; and  $R_3$  is a tertiary amino, an alkyl having from about 1 to about 12 carbon atoms; an aryl having from about 6 to about 20 carbon atoms; an alkaryl having from about 7 to about 20 carbon atoms; an alkenyl having from about 2 to about 12 carbon atoms; a cycloalkyl having from about 5 to about 20 carbon atoms; a cycloalkenyl having from about 5 to about 20 carbon atoms; a bicycloalkyl having from about 6 to about 20 carbon atoms; and, a bicycloalkenyl having from about 6 to about 20 carbon atoms; where n is an integer of from 0 to about 10.

United States Patent 6,084,025 may be relevant to the prosecution of the subject patent application because it discloses a functionalized polymer prepared by a process comprising the steps of: preparing a solution of a cyclic amine compound, an organolithium compound, and from 3 to about 300 equivalents, based upon one equivalent of lithium, of a

monomer selected from vinyl aromatic monomers, and mixtures thereof, where said cyclic amine compound is defined by the formula

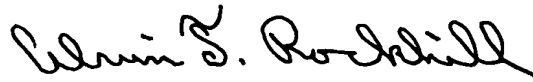


where  $R_2$  is selected from the group consisting of an alkylene, substituted alkylene, bicycloalkane, and oxy- or N-alkylamino-alkylene group having from about 3 to about 16 methylene groups, N is a nitrogen atom, and H is a hydrogen atom, thereby forming a polymerization initiator having the formula  $A(SOL)_yLi$ , where Li is a lithium atom, SOL is a divalent hydrocarbon group having from 3 to about 300 polymerized monomeric units, y is from 0.5 to about 3, and A is a cyclic amine radical derived from said cyclic amine; charging the solution containing  $A(SOL)_yLi$  with from about 0.01 to about 2 equivalents per equivalent of lithium of a chelating reagent, and an organic alkali metal compound selected from compounds having the formula  $R_4OM$ ,  $R_5C(O)OM$ ,  $R_6R_7NM$ , and  $R_8SO_3M$ , where  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ , and  $R_8$  are each selected from alkyls, cycloalkyls, alkenyls, aryls, or phenyls, having from 1 to about 12 carbon atoms; and where M is Na, K, Rb or Cs, and sufficient monomer to form a living polymeric structure; and quenching the living polymeric structure.

United States Patent 6,344,538 may be relevant to the prosecution of the subject patent application because it discloses functionalized monomers and polymerized functionalized monomers selected from the group consisting of 2-(N,N-dimethylaminomethyl)-1,3-butadiene, 2-(N,N-diethylaminomethyl)-1,3-butadiene, 2-(N,N-di-n-propylaminomethyl)-1,3-butadiene, 2-(cyanomethyl)-1,3-butadiene, 2-(aminomethyl)-1,3-butadiene, 2-(hydroxymethyl)-1,3-butadiene, 2-(carboxymethyl)-1,3-butadiene, 2-(acetoxymethyl)-1,3-butadiene, 2-(2-alkoxy-2-oxoethyl)-1,3-butadiene, 2,3-bis(cyanomethyl)-1,3-butadiene, 2,3-bis(dialkylaminomethyl)-1,3-butadiene, 2,3-bis(4-ethoxy-4-oxobutyl)-1,3-butadiene and 2,3-bis(3-cyanopropyl)-1,3-butadiene, and methods for preparing such functionalized diene monomers and polymers.

Form PTO-1449 is enclosed herewith.

Respectfully submitted,

A handwritten signature in black ink, reading "Alvin T. Rockhill". The signature is written in a cursive style with a large, stylized "A" and "R".

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Sheet 1 of 1

<b>FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use several sheets if necessary)	<b>ATTY DOCKET NO.</b> DN2002-237P02	<b>SERIAL NO.</b> 10/661,914
	<b>APPLICANT (S)</b> Adel Farhan Halasa et al	
	<b>FILING DATE</b> SEPTEMBER 12, 2003	<b>GROUP</b> 1713

**U.S. PATENT DOCUMENTS**

Examiner Initial	Document Number	Date	Name	Class	Sub-class	Filing Date if Appropriate
	6,111,045	Aug. 29,2000	Takagishi et al	526	338	
	6,211,321	Apr. 3, 2001	Takagishi et al	526	335	
	4,935,471	Jun. 19, 1990	Halasa et al	525	359	
	6,080,835	Jun. 27, 2000	Lawson et al	528	396	
	5,932,662	Aug. 3, 1999	Lawson et al	525	280	
	6,084,025	Jul. 4, 2000	Kitamura et al	524	575	
	6,344,538	Feb. 5, 2002	Sheares	528	396	

**FOREIGN PATENT DOCUMENTS**

Examiner Initial	Document Number	Date	Country	Class	Sub-Class	Translation YES NO

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)**

Examiner Initial		
EXAMINER	DATE CONSIDERED:	

Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.